NTSB MOST WANTED

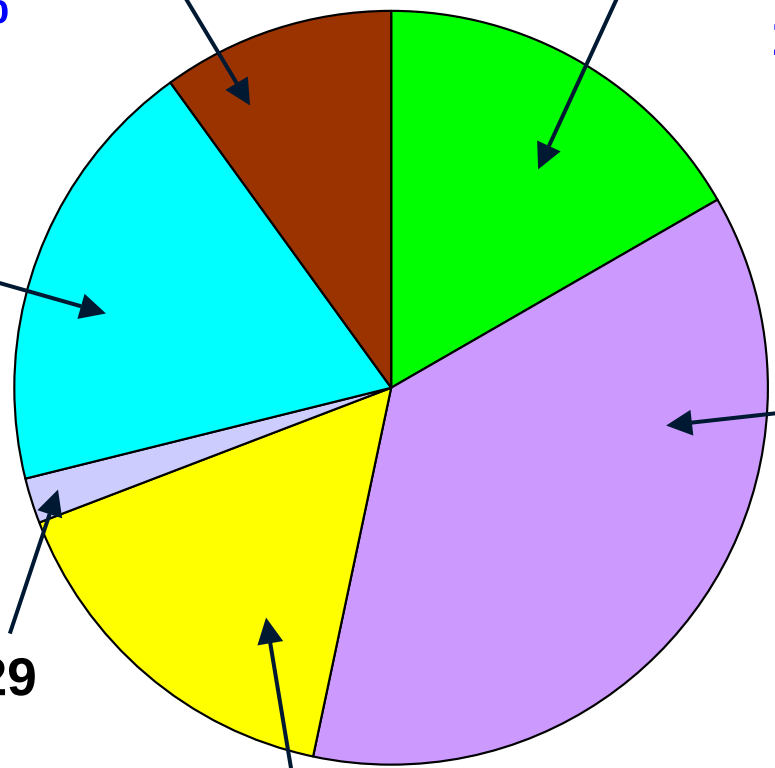
Transportation Safety Improvements

Critical changes needed to reduce transportation accidents and save lives.

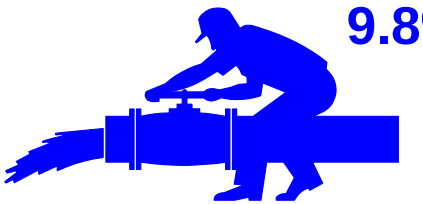
Safety Recommendations

Issued Since 1967

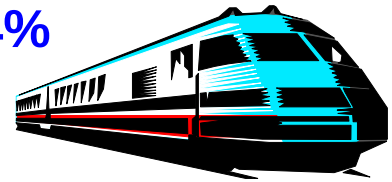
TOTAL: 12,257



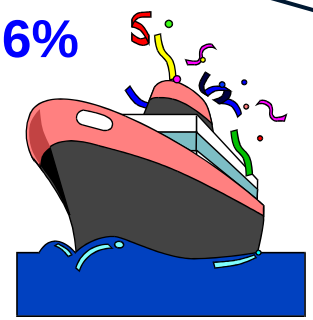
Pipeline 1207
9.8%



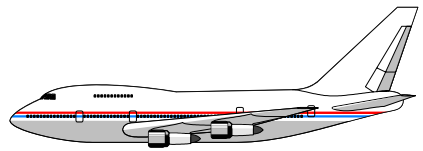
Railroad 2011
16.4%



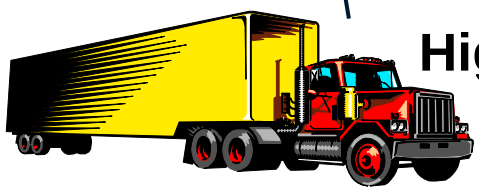
Marine 2274
18.6%



Aviation 4537
37%



Intermodal 229
1.9%



Highway 1999
16.3%

November 2004

Acceptance Rates

All Recommendations

82%

Most Wanted List Recommendations

85%

808 Open Recommendations

- 504 to U.S DOT modal agencies
- 45 to U.S. Coast Guard
- 32 to States:

22 highway, 1 aviation, 8 marine, 1 rail

- 198 to industry and advocacy groups
- 29 others

Issue areas selected for intensive follow-up and heightened awareness because they:

- Will impact and enhance safety of the nation's transportation system
- Have a high level of public visibility and interest
- Will benefit from special form of encouragement

60 Safety Recommendations on Most Wanted List

Federal Issues 50

DOT Secretary	1	RSPA	2
FAA	22	FRA	2
FMCSA	9	USCG	10
NHTSA	4		

State Issues 10

NTSB MOST WANTED

Transportation Safety Improvements

Aviation

- Reduce Dangers to Aircraft Flying in Icing Conditions
- Eliminate Flammable Fuel/Air Vapors in Fuel Tanks on Transport Category Aircraft
- Stop Runway Incursions/Ground Collisions of Aircraft
- Improve Audio and Data Recorders/Require Video Recorders
- Require Restraint Systems for Children Under Age 2

Highway

- Improve the Safety of Motor Carrier Operations
- Prevent Medically-Unqualified Drivers from Operating Commercial Vehicles
- Enhance Protection for Bus Passengers

Intermodal

- Update Hours-of-Service Regulations in Aviation, Marine and Pipeline Industries

Marine

- Improve Drug and Alcohol Testing of Crews After Accidents
- Require Voyage Data Recorders

Rail

- Implement Positive Train Control
- Improve Survivability of Recorders

"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

Reduce Dangers to Aircraft Flying in Icing Conditions

Safety Improvements Wanted

- Expedite research into effects of in-flight icing, including freezing rain and critical ice shapes A-98-92
- Upgrade aircraft certification standards and operational procedures A-96-54, A-96-56, A-98-100

Cessna 208B Caravan

- Single-engine turboprop airplane
- Seats 10 pax, or haul freight
- Successfully passed current FAA icing certification, and additional review of icing concerns
- Seven icing-related fatal accidents in last 3 years
- Subject of current special assessment by staff

Cessna 208B Suspected Icing Accidents

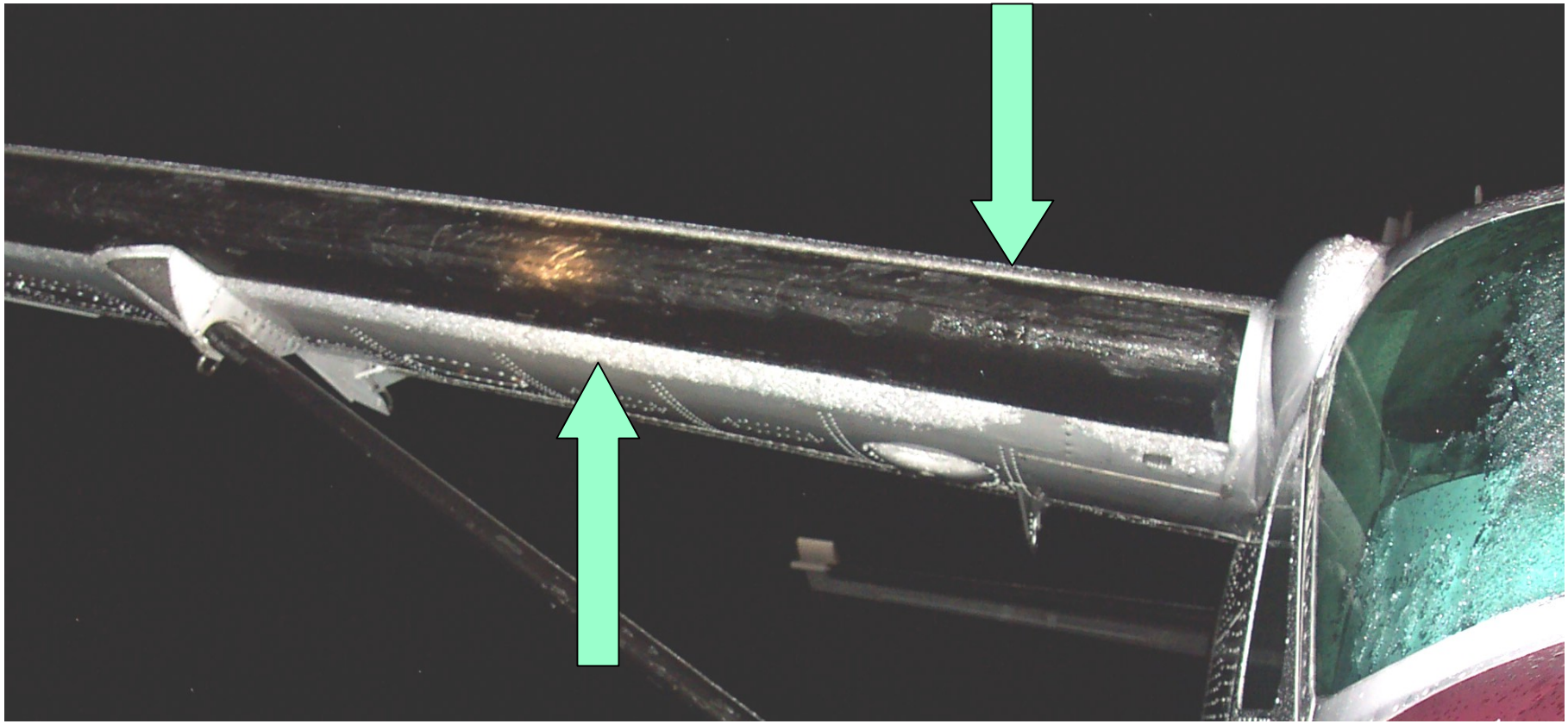
2001-2004

- April 2001, Argentina: ***10 fatal***
- May 2001, Steamboat Springs, CO: ***1 fatal***
- October 2001, Dillingham, AK: ***10 fatal***
- March 2002, Barrow, AK: ***5 seriously injured***
- March 2002, Alma, WI: ***1 fatal***
- November 2002, Parks, AZ: ***4 fatal***
- October 2003, Cody, WY: ***1 fatal***
- January 2004, Pelee Island, Ontario: ***10 fatal***

Under Investigation – TSB Canada

37 Total Fatalities

November 2003 Cessna 208B Caravan
Hard Landing in Icing Conditions



FAA - ARAC Actions for A-96-54

- **1996 – 2002**

  FAA tasks Aviation Regulatory Advisory Committee (ARAC) working group to develop certification criteria and gathered required data

- **2002**

  ARAC accepted concept developed by Ice Protection Group for regulatory requirements in ‘supercooled large droplets’

FAA - ARAC Actions

- **2004** FAA was scheduled to issue NPRM for new expanded Appendix C (icing conditions for icing certification), including ‘supercooled large droplets’ related regulatory changes and advisory materials in June 2004
- Delayed until next year

Reduce Dangers to Aircraft Flying in Icing Conditions

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Reclassify A-96-54 and A-96-56: 'Open - Unacceptable'**
- **Change designation from yellow to red: Unacceptable response**

Timeliness Classification	RED

Eliminate Flammable Fuel/Air Vapors in Fuel Tanks on Transport Category Aircraft

Safety Improvements Wanted

- Develop airplane design modifications such as nitrogen-inerting and insulation between heat-generating equipment and fuel tanks A-96-174

- Modify operations to reduce the potential for fuel-air mixtures in the fuel tanks of transport category aircraft to be flammable A-96-175

Avianca 727 November 1989

PAL 737 May 1990

Major Passenger Airline

Center Wing Tank Explosions

TWA 747 July 1996

Thai Airways March 2001

FAA and ARAC Actions

- **1998 ARAC** found no cost effective solutions, and recommended further investigation of flammability reduction methods

- **SFAR 88** Regulated ignition source mitigation and flammability minimization in new airplane designs

- **2001 ARAC** found no inerting system produced benefits that were reasonably balanced by cost. ARAC did not recommend regulatory text for fuel tank inerting

FAA Actions

Inerting System Prototype

- Flight tested since May 2002
- Provided effective inerting
- Successful Boeing and Airbus flight tests

FAA Actions

Developing Notice of Proposed Rulemaking

- Expected release in 2005
- Addresses current fleet and newly manufactured airplanes

No significant operational changes mandated

Eliminate Flammable Fuel/Air Vapors in Fuel Tanks

Proposed Safety Board Action

- Keep issue area on Most Wanted List
- Reclassify A-96-175 'open – unacceptable'
- Retain A-96-174 as 'open – acceptable'
- Retain yellow designation:

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

Stop Runway Incursions and Ground Collisions of Aircraft

Safety Improvements Wanted

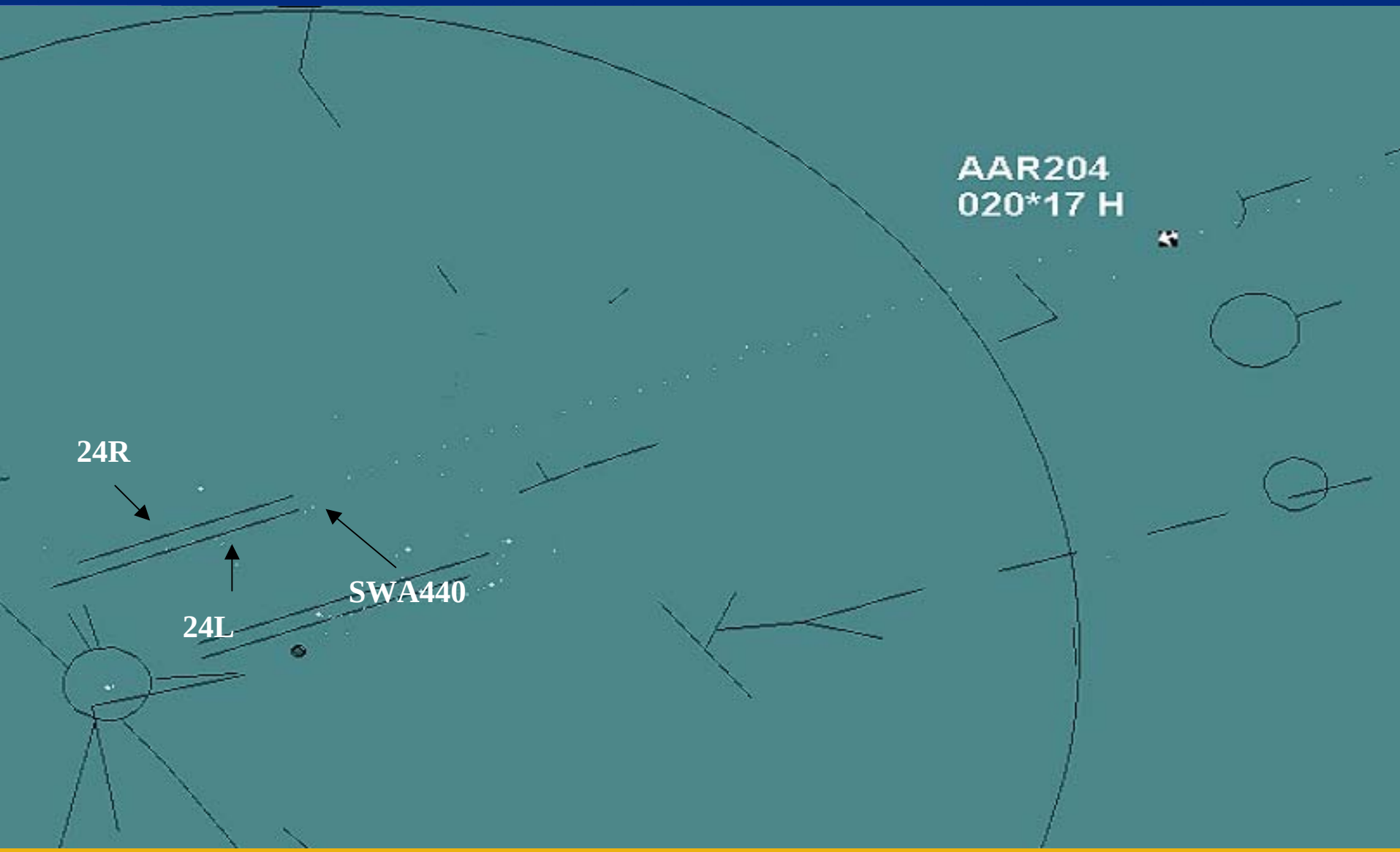
- Develop ground movement safety systems that will provide direct warning to flight crews in the cockpit A-00-66

Runway Incursion

- August 19, 2004
- 2:55 p.m.
- Los Angeles International Airport
- Asiana 747, Flight 204
- Southwest 737, Flight 440

NTSB MOST WANTED

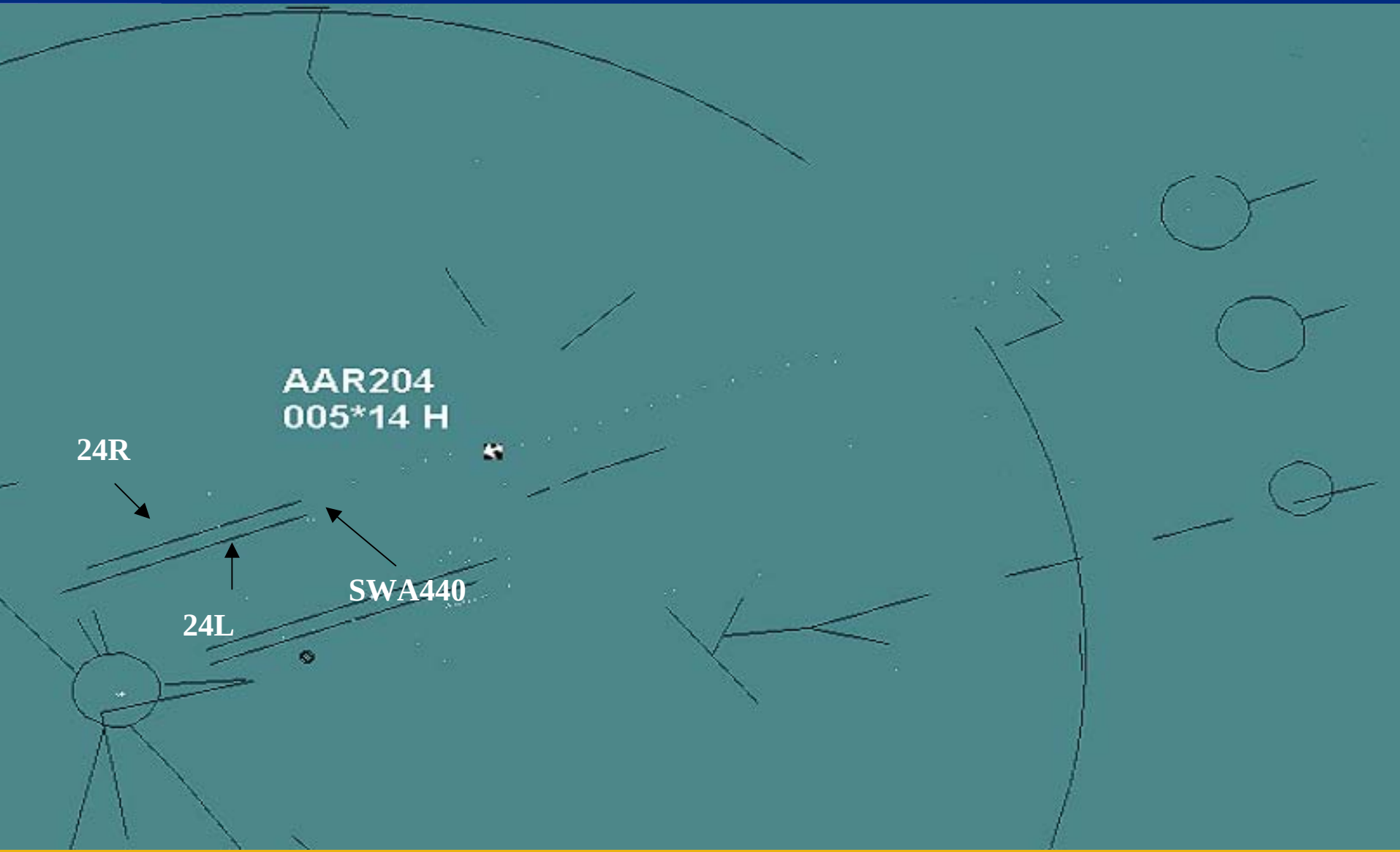
Transportation Safety Improvements



"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

NTSB MOST WANTED

Transportation Safety Improvements



"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

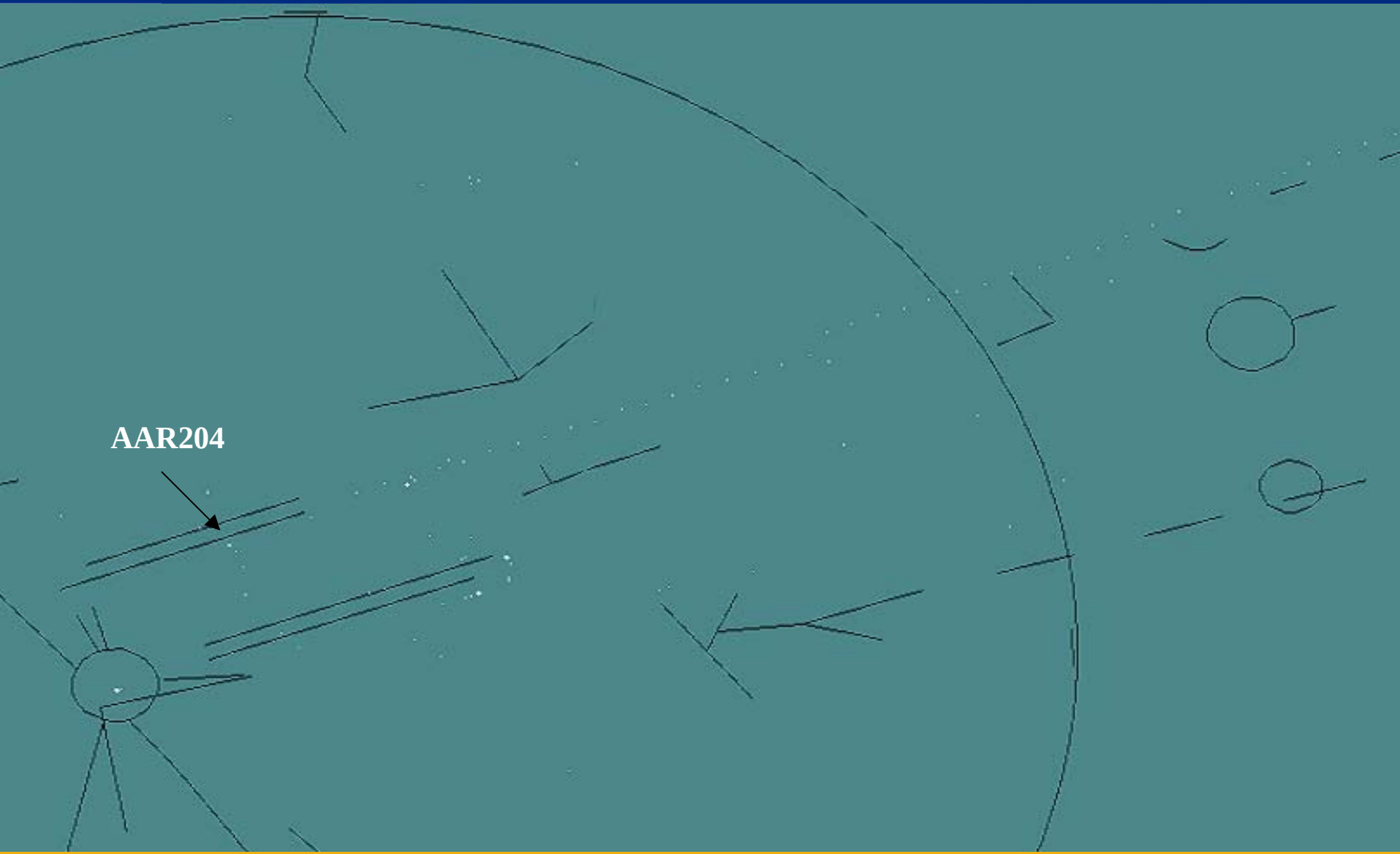
NTSB MOST WANTED

Transportation Safety Improvements

"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

NTSB MOST WANTED

Transportation Safety Improvements



"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

Aircraft Positions at Time of AMASS Warning

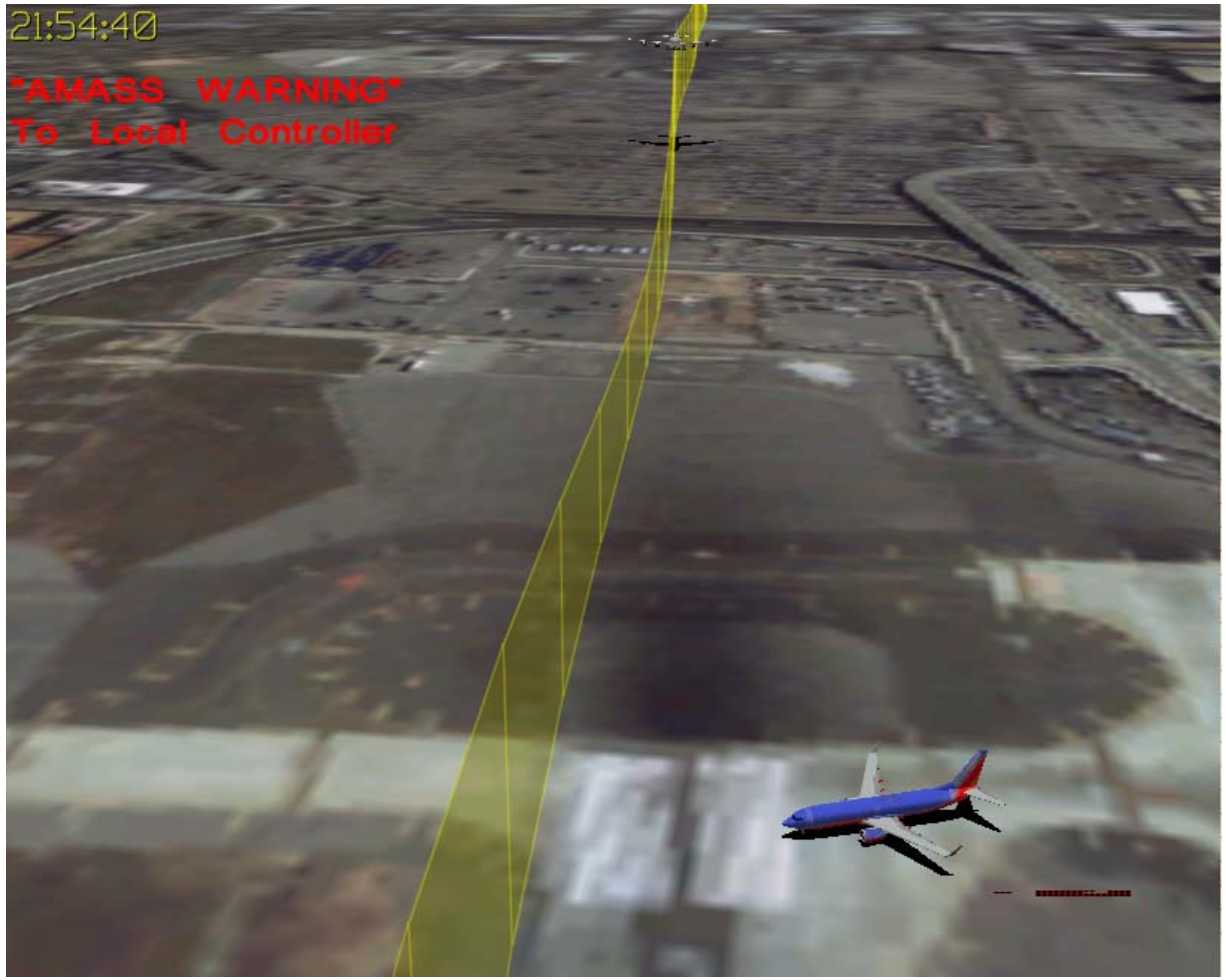
Separation

Distance

2490 feet

Time

12 seconds



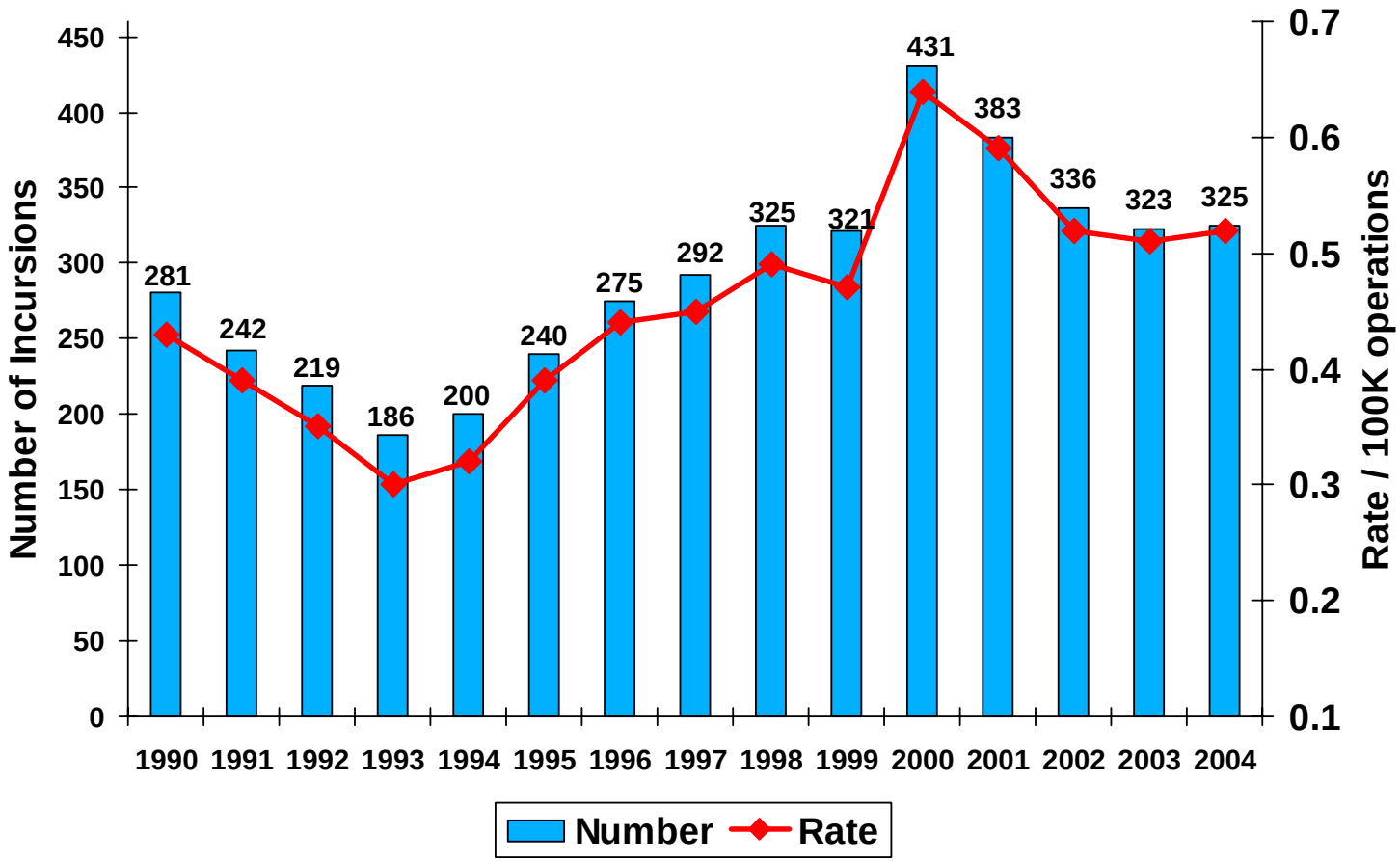
Position at Closest Point

Vertical Separation

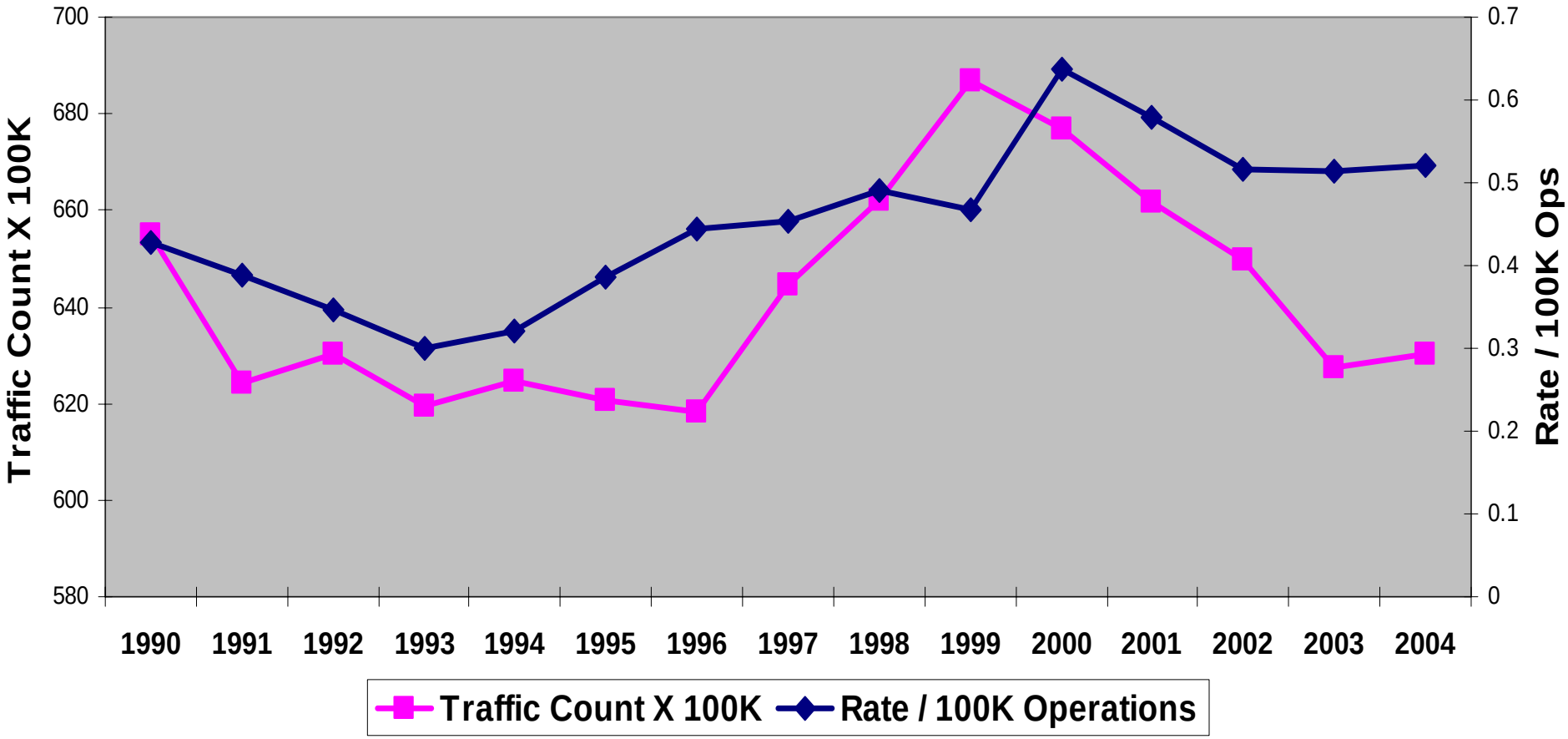
About 185 feet

Runway Incursions 1990-2004

Number and Rate



Incursion Rate per 100,000 Tower Operations



FAA Actions

- Final Approach Runway Occupancy Signal
- Enhanced Airfield Lighting
- Runway Status Lights

Stop Runway Incursions and Ground Collisions of Aircraft

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Change yellow designation to red:**
  Unacceptable response

Timeliness Classification	RED

Improve Aviation Audio and Data Recorders and Require Cockpit Video Recorders

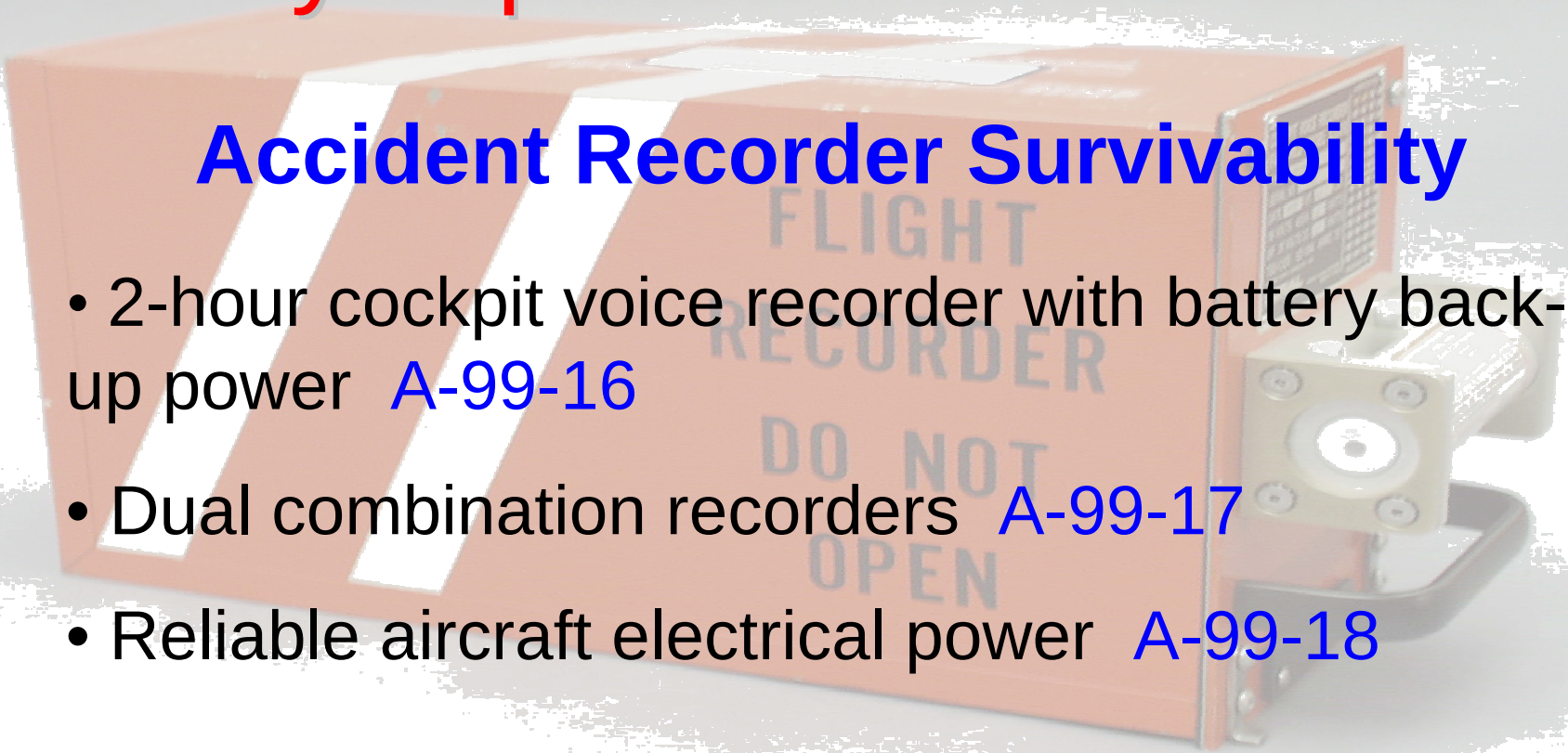
NTSB MOST WANTED

Transportation Safety Improvements

- Retrofit 30 minutes to 2-hour CVRs
- 10-minute backup power
- Dual redundant CVR/FDR
- 737 additional parameters
- Cockpit video recorders

"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

Safety Improvements Wanted



Accident Recorder Survivability

- 2-hour cockpit voice recorder with battery back-up power A-99-16
- Dual combination recorders A-99-17
- Reliable aircraft electrical power A-99-18

FAA ACTIVITY

- Draft FDR Enhancement NPRM
  - 2-Hour CVR
  - Recorder independent power supply
  - Dual redundant CVR/FDR
  - Enhances FDR sample rates
- Draft NPRM cleared OST, is at OMB

Safety Improvements Wanted

Additional Boeing 737 Flight Data Recorder Parameters

- **Upgrades for 737 series aircraft**

A-99-28 and 29

Safety Improvements Wanted

Cockpit Video Recorders

- Adopt technical standard for image recorder A-99-59
- Require image recorder in all Part 121/135 turbine aircraft not previously equipped with recorders A-03-64
- 2-hour cockpit image recorder in larger transport category aircraft A-00-30 and 31

Video Recorder Update

- NTSB Hearing July 27-28, 2004
- Parties included
  - FAA
  - Pilot unions
  - Airline groups
- Issues
  - Regulatory, privacy, cost

Improve Audio and Data Recorders Require Video Recorders

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Retain red designation:**
  Unacceptable response

Timeliness Classification	RED

Require Restraint Systems for Children Under Age 2

Safety Improvements Wanted

- Require all occupants be restrained during takeoff, landing and turbulence, and require infants and small children be restrained appropriately for their size. A-95-51

NTSB Board Meeting August 2004

- Child restraint issue discussed in depth
- Board voted to keep issue on Most Wanted List
- Classified recommendation as 'unacceptable response'
- No action from FAA since Board meeting

Require Restraint Systems for Children Under Age 2

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Retain red designation:**
  Unacceptable response

Timeliness Classification	RED

Improve the Safety of Motor Carrier Operations

Safety Improvements Wanted

- Change the way safety fitness ratings are determined so adverse vehicle and driver performance alone are sufficient to result in an overall unsatisfactory rating for the carrier H-99-6

Truck Fitness Safety Ratings

Safety Fitness Factors

- General
- Drivers
- Operations
- Vehicles
- Hazardous Materials
- Accidents

Truck Fitness Safety Ratings

Accident Factors

- General
- **Drivers**
- Operations
- **Vehicles**
- Hazardous Materials
- Accidents

FMCSA Actions

- Planning to issue NPRM for revised safety rating system
- Continue efforts to develop truck fitness rating standards that appropriately recognize importance of vehicle and driver factors

Improve the Safety of Motor Carrier Operations

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Change designation from green to yellow:**

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

Prevent Medically-Unqualified Drivers from Operating Commercial Vehicles

Safety Improvements Wanted

- Develop comprehensive medical oversight program that addresses:
  - Examiner qualifications
  - Adequacy of regulations
  - Non-regulatory guidance
  - Review process
  - Tracking mechanisms
  - Enforcement and Reporting

  H-01-17 thru H-01-24

FMCSA Actions

- Medical Division
- Contracts awarded to:
  - Create a Medical Advisory Board
  - Create Registry/Certification for Examiners
- Working on NPRM to merge CDL/medical certificates

Prevent Medically-Unqualified Drivers from Operating Commercial Vehicles

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**

- **Retain yellow designation:**

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

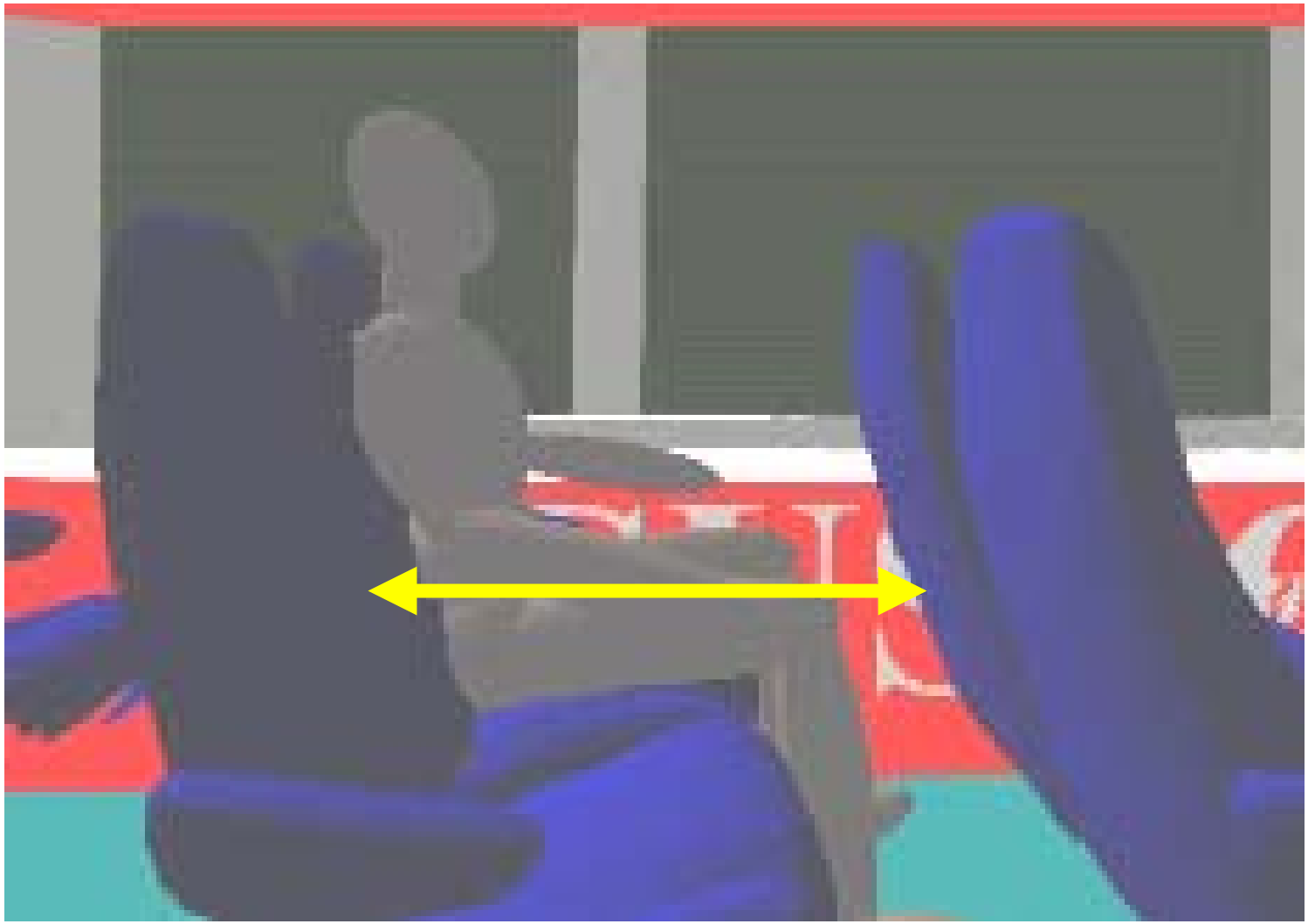
Enhance Protection for Bus Passengers

Safety Improvements Wanted

- Roof strength requirements to provide maximum survival space H-99-50
- Easy opening window and roof exits that stay open during evacuations H-99-9
- Occupant protection systems during impacts and rollovers H-99-47
- Standard definitions for bus body types H-99-43

NTSB MOST WANTED

Transportation Safety Improvements



"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

NTSB MOST WANTED

Transportation Safety Improvements

New Orleans

May 1999

"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

NHTSA Actions

- Recommendations issued in 1999
- NHTSA has scheduled an NPRM for fall of 2004
- NHTSA has *not* reached consensus with motorcoach manufacturers on bus window retention requirements or new bus classification system

NTSB MOST WANTED
Transportation Safety Improvements

14 Killed, 16 Injured
October 2004, Turrell, AR

"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

Enhance Protection for Bus Passengers

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Reclassify H-99-43 to FMCSA: 'Closed-Reconsidered'**

Retain yellow designation:

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

Update Hours-of-Service Regulations in Aviation, Marine and Pipeline Industries

1989 DOT Fatigue Recommendations

- I-89-1: Research – **Closed Acceptable**
- I-89-2: Education – **Closed Acceptable**
- I-89-3: Hours of Service Regulations – **Closed Superseded**

Safety Improvements Wanted

- Establish scientifically-based hours-of-service rules that set limits on work hours, provide predictable work and rest schedules, and consider circadian rhythms and human sleep and rest requirements. I-99-1

- Modal recommendations to DOT, FRA, FMCSA, FAA U.S. CG and RSPA

Department of Transportation

- I-99-1: Require the modal administrations to establish scientifically-based HOS regulations
- DOT Human Factors Coordinating Committee: Operator Fatigue Management (OFM) Program
- Products: Work scheduling software, fatigue management guide

Aviation

- A-94-194, A-95-113, A-97-71, A-99-45
- Flight and duty time limits set in 1938 and 1958
- FAA issued NPRM in 1995 to update flight/duty time regulations – but no rule issued
- FAA has conducted research on fatigue in maintenance, but no rulemaking proposed

Marine

- M-99-1
- Work-hour limitations date to early 1900s
- International Maritime Organization amended 'Standards of Training, Certification and Watchkeeping for Seafarers' in 1995
- Coast Guard and Maritime Transportation Act

Pipeline

- P-98-30, P-99-12
- No Federal hours-of-service regulations exist for operators or controllers of pipeline systems
- RSPA pursuing research on work-rest cycles, fatigue measurement, and fatigue management

Update Hours-of-Service Regulations in Aviation, Marine and Pipeline Industries

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**

- **Retain yellow designation:**

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

Improve Drug and Alcohol Testing of Crews After Accidents

Safety Improvements Wanted

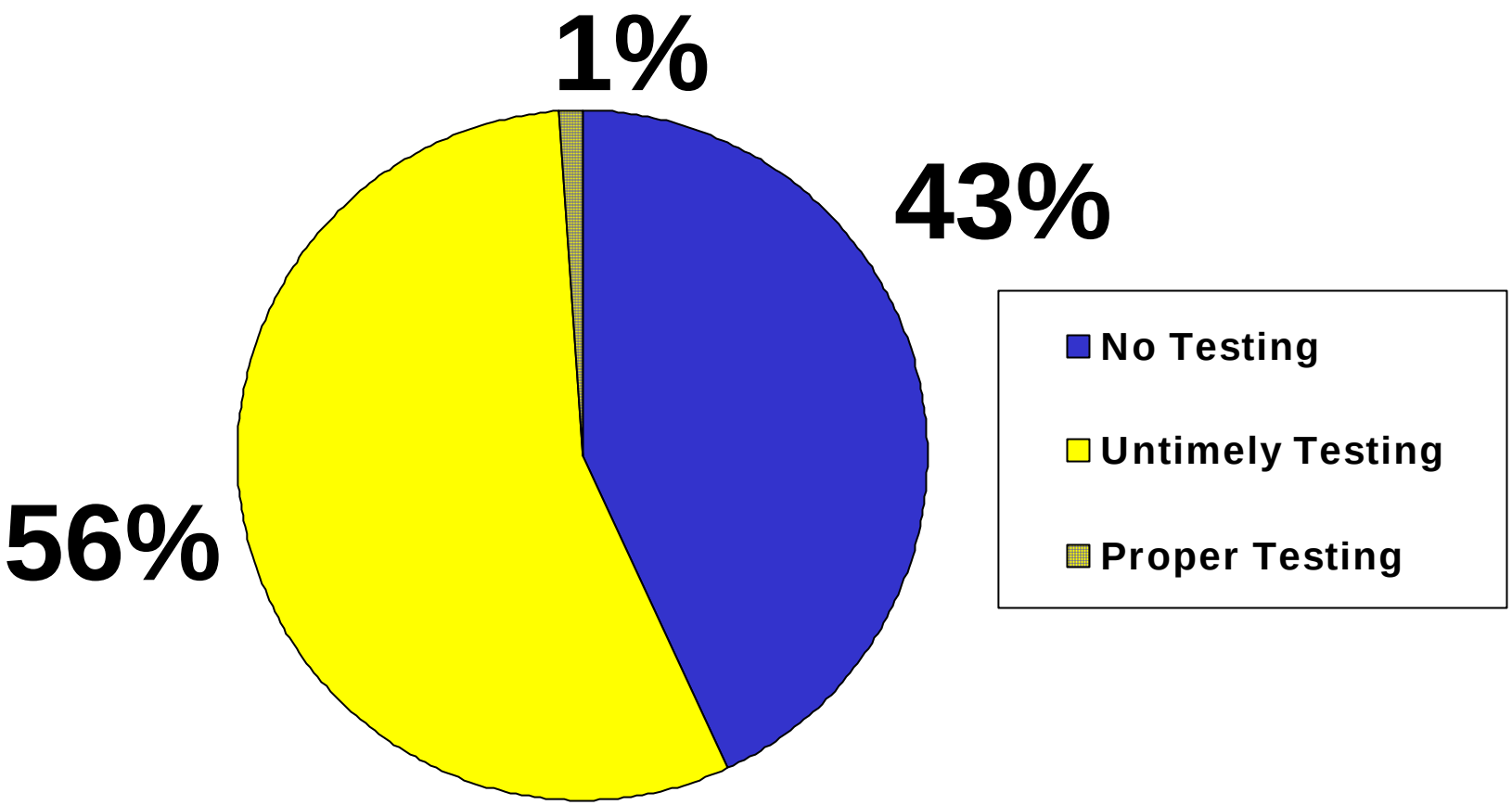
- Task force to evaluate deficiencies in post- accident testing and implement program based on 'lessons learned' M-98-72
- Breath and urine-testing devices on foreign ships in U.S. waters and U.S. oceangoing ships
  M-98-75
- Clear post-accident collecting and testing procedures, responsibilities and time limits, and abstinence from alcohol
  M-98-71, M-98-73, M-98-76, N-98-77,M-98-79, M-98-81

NTSB Special Investigation Report

Alcohol and Drug Testing

- 1998 report cited 28 major marine accidents since *Exxon Valdez*
- Identified shortcomings in post-accident testing process.

Post-Accident Alcohol Testing



Congressional Action

- 1998 Federal law requires the establishment of procedures to ensure post-accident alcohol testing within 2 hours, unless prevented by concerns for safety directly related to accident

Coast Guard Action

- 2003 Notice of proposed rulemaking on chemical testing following serious marine incidents

NTSB MOST WANTED

Transportation Safety Improvements

"... a program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

Improve Drug and Alcohol Testing of Crews After Accidents

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**

- **Retain yellow designation:**

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

Require Voyage Data Recorders

Safety Improvements Wanted

USCG Actions

- Propose to International Maritime Organization that all ships on international voyages be equipped with voyage data recorders M-95-6

IMO Requirements for Ships on International Voyages

- All new passenger ships: **Yes**
- All new cargo ships: **Yes**
- All existing passenger ships: **Yes**
- All existing cargo ships: **Expected Dec. 2004**

Safety Improvements Wanted

IMO Actions

- IMO Maritime Safety Committee adoption of requirement for voyage data recorders on existing cargo vessels in December 2004

Require Voyage Data Recorders

Proposed Safety Board Action

- Remove issue area from Most Wanted List
- Recommendation remain 'open' pending IMO final approval

Vessel Types and Requirements

- SOLAS applies to all vessels over 500 gross tons (ITC).
- S-VDRs will be required on all existing cargo vessels over 3,000 gross tons.
- Vessels in 500 – 3,000 gross tonnage range are generally self-propelled, ocean going on unrestricted routes, and less than about 200 ft in length.
- About 160 foreign flag cargo vessels (500-3,000 gross tonnage) have traded U.S. and made about 1,500 port calls (Jan-Oct 2004).
- 77,000 port calls have been made by all foreign flag vessels (Jan-Oct 2004).

Implement Positive Train Control Systems

Safety Improvements Wanted

- Develop and implement positive train control systems that include collision avoidance.

- Require implementation of positive train control on main line tracks, giving priority to high-risk corridors where commuter and intercity passenger railroads operate.
  R-01-6

Human Factors Causes

- Fatigue
- Sleep-Apnea
- Medication
- Reduced Visibility
- Distractions

Train Accidents

FRA reported accidents for 2003

- 145 head-on, rear-end, and side collisions
- 132 or 91% attributed to human factor causes

Accidents Under Investigation

4 Collisions During Past Year

- November 2003: Kelso, WA
- February 2004: Carrizozo, NM
- April 2004: Gunter, TX
- June 2004: Macdona, TX

Slow Progress

- ‘Most Wanted List’ since 1990
- 2003 Senate Appropriations Committee Report

FRA Action

- NPRM Issued in August 2001 to establish standards for the development and use of processor-based signal and train control systems

Positive Train Control Projects

- Amtrak
  436 miles installed on Northeast Corridor
  45 miles installed on Michigan Line

- New Jersey Transit
  23 miles of 540 miles installed

- Alaska Railroad
  611 miles under development

- North American Joint Positive Train Control Project
  120 miles being installed between Chicago and St. Louis

Implement Positive Train Control Systems

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Retain yellow designation:**

Acceptable response – progressing slowly

Timeliness Classification	YELLOW

Improve Railroad Recorder Survivability

Safety Improvements Wanted

- Establish crash survivability standards for locomotive event data recorders for new and rebuilt locomotives R-98-30

FRA Actions

- FRA issued NPRM concerning locomotive crashworthy event recorders on June 30, 2004
- Held a public hearing on September 30 to discuss interested parties concerns
- Reconvening RSAC committee in December to discuss received comments

Improve Survivability of Recorders

Proposed Safety Board Action

- **Keep issue area on Most Wanted List**
- **Retain red designation:**
  Unacceptable response

Timeliness Classification	RED

Most Wanted List Federal Issues

Vote to adopt full report